

MODIS Quartely Report
July-Sept. 1994
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Activity in this period included:

1. Writing of the beta software algorithms on aerosol, fires and water vapor
2. Preparation and execution of the SCAR-C experiment
3. Advancement in the MODIS remote sensing of aerosol over the land by improving the empirical relationships between the surface reflectance properties in the blue, red and 2.1 μm .
4. Work on generation of sulfate and smoke aerosol models, where the aerosol size distribution is described by the total optical thickness.

Main activity: SCAR-C

The SCAR-C (Smoke Clouds And Radiation - California) field experiment took place 19 Sep to 8 Oct. '94. The main objectives were to collect data for development and validation of the MODIS fire detection and smoke aerosol detection algorithms, characterize the biomass burning and fire-produced smoke from remote sensing and in situ measurements, study the smoke interaction with clouds, characterize the background aerosol of the west coast, validate remote sensing algorithms and obtain images of dry zone vegetation for studies of surface reflectance in the visible and near-IR spectral regions. In these objectives we were successful in all cases except the study of smoke interaction with clouds due to the absence of clouds in each of the burning situations encountered. Other participants in SCAR-C included D.S. McDougal, R. Cofer, B. Holben, C. Justice, and J. Conel of NASA, P. Hobbs, D. Hegg and R. Ferek of Univerisity of Washington, L. Flynn of the Unversity of Hawaii, D. Ward and R. Ottmar of the U.S.D.A, Paulo Artaxo from U. Sao Paulo and C. Louisse from Lawrence Livermore lab..

We acquired an outstanding data set consisting of 4 prescribed burns in western Washington and one near Tillamook Oregon as well as 2 wildfires in California and several wildfire complexes in Idaho. Each research group was able to observe smoke from both wildfires and prescribed burns. There were at least three occasions where we acquired remote sensing data from the ER-2 simultaneous to in situ observations made by the Univ. of Washington aircraft. In addition, there was one situation where the smoke was observed by the JPL sunphotometers on the ground, by the Univ. of Washington plane in the smoke plume and by the ER-2 from above. The ER-2 carried the MODIS Airborne Simulator (MAS) and AVIRIS, but the lidar system was not integrated onto the plane in time for the experiment. The MAS was flown in a modified 12 channel

configuration because the 50 channel version was not ready. NASA/AMES will take responsibility for the MAS calibration with assistance from NASA/GSFC engineers and technicians in order to maintain continuity.

Five automatic sun/sky photometers were deployed for SCAR-C. One near Ukiah OR, one in an agricultural burn area in the Willamette Valley in Oregon and two in the Sacramento Valley of California. In addition, a sun/sky photometer continued to collect data at the H.J. Andrews LTER site in Oregon. Additionally, in situ aerosol samples were collected from a vertical balloon array near Boardman OR. These samples will be analyzed using an electron microscope.

Preliminary results were presented in the MODIS team meeting.